#5

An Essay on the Cicuta maculata

by Marcus C. Buck
of Fredericksburg Virginia

1812

Nulla quidem est philosophiae pars aut historiae naturalis, quam a medicinae studio existimare licet alienam.

Macfarlane &c.

And may we not yet look for the discovery of medicines as important to mankind as Opium, the Bark, & Mercury. — Professor Barlow.

we have
frequen
relatives,
accident,
the frau
from eg
the pro
Cruta
qualities
= cually
country a
To
not only
ies of
adva
warn
the a
ts of

In reflecting on the various means by which we have been led to our discoveries in Nature, we have too frequently to deplore the fate of genius, of friends, of relatives, who by the eager pursuit of knowledge, or by accident, have been destined to give birth to discoveries, the fruits of which an untimely death has prevented them from enjoying. — Amongst the causes contributing to the production of this effect, may be considered the Cicuta Maculata, an article, of which the poisonous qualities though sufficiently established, are not so gen= = erally known as the safety of the inhabitants of a country abounding with it demands. —

To the consideration of this subject I am impelled not only by its intrinsick importance, but by the strong ties of fraternal affection, which invoke me to convert to advantage a misfortune which is irremediable, or to warn others against incurring it.

To the deleterious properties of this plant I owe the loss of a dear relation, a brother, whose sprightliness,

and amea-
tance, &
tenate p-
found
These
servations
me with
I fortun-
even inde-
afford so
by the
I su-
summer
=ments;
after I
a sufficie
had my
to my co
cumstan-
exhaxxix

and amiable qualities endeared him to every acquaintance, & rendered him the favorite of his over affectionate parents, who had anxiously hoped to have found in him the comfort of declining age.

These considerations, while they awaken all those sensations which are their natural result, inspire me with fresh vigour to the research. — And should I fortunately suggest any thing which may tend, even indirectly, to the benefit of mankind, it will afford some alleviation to the distress occasioned by the loss of so dear a relation.

I regret that my situation during the last summer did not admit of my making these experiments; I hoped to have been able to continue them after I came hither, but I did not bring with me a sufficient quantity of the plant. — And if I had my requisite studies would have been an obstacle to my conducting them properly. — Under these circumstances I hope you will rest satisfied with those ~~exhaxxxxxxx~~ which have been hastily made by

on unac-
have more

Th

-ural order
United Stat
Virginia
parsnip
spring, w
ber & Oct
four or
about th
ster & de
-cordate &
size of th
having a
The wh
-times th
about the

T. Th

one unaccustomed to experimenting, until he shall have more time to devote to the subject. —

The Cicuta maculata is a plant of the natural order umbelliferæ. – It grows abundantly in the United States, particularly in the moist meadows of Virginia. – It is there known by the names of Wild parsnip & Wild carrot. – It puts forth early in the Spring, blossoms in June & its seed ripen in September & October. – It generally grows to the height of four or six feet. – It has a large hollow stalk, about the size of the middle finger. It is a compound stem & dichotomous or forked. – The leaves are oblong lanceolate & serrate. – The seed is small & oval about the size of the fennel. – The root is horizontal & tuberose, having a number of radicles shooting out from the side. The whole plant is most frequently green, but sometimes the stalk inclines to white, & often purple particularly about the joints.

To the Smell this plant is to most persons ex=

tremely de
too aroma
the root is t
the reverse
Dest, the
Its taste
for the st
ustances, fro
root. —

I have
on this pla
s greede
Sheccon th
beech an
point in
-dro, strug
-bling thro

-tremely disagreeable. - The leaves are somewhat bit-
-ter aromatic & unpleasant to the taste. - The taste of
the root is to some persons agreeable, but to me, very much
the reverse (perhaps from association, having once tas-
-ted it, till I had witnessed its poisonous effects.)
Its taste & appearance have caused it to be mistaken
for the sweet anise, a mistake, which has in several
instances, proved fatal to the unfortunate lovers of that
root. -

I have not discovered that any of our animals feed
on this plant. - Hogs carefully avoid it, though they
so greedily devour most roots. I have frequently
thrown the whole plant to them & never saw them
touch any part of it. — On examining the
plant in the middle of Septr. I found it quite yel-
-low, stripped of its leaves & covered by insects resem-
-bling those which are seen on the cabbages.

Experime
on the diff
vidently p
in. The
The pec
celeteri
ic princi
digitalis
that it
=ruced
it s-pec
=ry is so
Ring down
lard dow
=stances an
of the an
All veg
different
gen, re
& nutrit

Chemical analysis.

Experiments made (by the assistance of Dr. Cullush) on the different parts of this plant evidently prove that they severally contain Gum & resin. The epidermis afforded gallic acid & tannin. The peculiar property of the plant in producing deleterious effects, no doubt depends on the narcotic principle, which Chemists have discovered in Digitalis &c. But this principle is of subtile a nature that it would elude the experiments of an inexperienced Chemist; I therefore did not attempt to obtain it separately. — No subject of chemical inquiry is so difficult as the examination of the Vegetable Kingdom. — For notwithstanding general rules have been laid down for such investigations, yet vegetable substances are so complicated in their structure, that the means of the analytical Chemist are frequently inadequate. All vegetables are composed of a number of substances possessing different qualities, some of which the narcotic principle gum, resin &c. Yet we find some of these are wholesome & nutritious while others are poisonous in the extreme.

Eff
Experim
at heav
with mu
grown, a
in a pie
pills very
I made
he the
ot the
-tained
ake the
evenings.
Shutting
-p at th
-clusive
efforts
then clo
table, for
Leaving

Effects on animals.

Experiment 1.st — Half a drachm of the dri-
ed leaves, finely pulverised were made into 8 pills
with mucilage of gum Arabic. To a Cat nearly
grown, one pill at a time was given wrapped up
in a piece of beef steak. — She swallowed 5 of the
pills very readily, but it was with difficulty that
I made her swallow the 6.th — I attempted to give
her the 7.th which she obstinately refused, spitting
out the meat as soon as she discovered that it con-
tained a pill. During my attempts to make her
take the last pill she shewed evident signs of un-
easiness. — In 5 minutes she became very sick, first
shutting her eyes very closely, then looking stead fast-
ly at the ceiling. — In 2 minutes more she had con-
vulsive twitches of the muscles of respiration. She made
efforts to vomit, which she did not effect. — She
then closed her eyes, & as she sat on the side of the
table, tottered so as to be in danger of falling off.
During this time a rat made a great noise in one

cause of
notice, h
continued
& walked
the noise
minutes,
very gre
so much
room & t
clock

Ex

the same
& stalk.
I am in
follow
the injec
= vulsive
= wards
her posteri
had bee

corner of the room, of which she took not the least notice, though she is generally very vigilant. – She continued in this torpid state 20 minutes, she then rose & walked very unsteadily to the place from whence the noise of the rat proceeded. After watching a few minutes, she went to a vessel of water & drank very greedily, but I did not suffer her to drink so much as she wished. – I now shut her up in the room & left her, as it was growing dark – At 9 O-Clock next morning I found her apparently well. –

Experiment 2nd – On the next day, I gave the same cat ½j of a saturated tincture of the leaves & stalk. – In conducting this, & several other experiments, I am indebted to the assistance of my ingenious fellow student Mr. Griggs. – In 2 minutes after the injection, the cat became very restless, drawing convulsively her head between her fore legs, & those towards her abdomen. When she walked, she dragged her posterior extremities on the floor, as if her loins had been injured. – She now had a considerable

above dis
means. —
nard a p
minute
in quand
the stem
length)
slender, th
the 10th
faces. —
which sh
fig did no
ly as
she has
Exp
the seed
Si 4 m
ites arr
ite, an
moved th

alvine discharge, which was hard & black coved with mucus. — On the 3rd & 5th minutes she again evacuated a fluid, resembling the tincture. On the 6th minute she vomited a fluid ~~much darker & greater~~ in quantity than the tincture. — With the fluid she threw up a large knot of worms (about 3 inches in length) resembling lumbrici, but darker & more slender, than those found in the human species. — On the 10th 15th & 20th minutes made attempts to discharge faeces. — On the 50th minute she fell into a sleep from which she frequently started. In this state I left her & did not see her for 2 days, when she appeared nearly as lively as usual, but as much emaciated as if she had eat nothing since the experiment

Expt. 3rd. Ten drops of a saturated tincture of the seed were given to a chicken more than half grown. In 4 minutes it had an alvine discharge; in 9 minutes another, breathing very laboriously. 12th minute, another evacuation. It now looked very wild & moved its head from side to side ~~&~~ by a sudden

pk 8 s

Expt. 4

tincture w

fell back

far as to

vulsive t

case to w

The twitch

by a mo

so bad th

vere. In

of the a

this did

will its

tion o

Expt

we poun

its respir

became

took place

jerk & started frequently as if frightened

Expt. 4th – To the same 35 minutes after ℥j of the tincture was given. Immediately after swallowing, it fell back & gasped as if dying; but it recovered so far as to get up & walk. In 10 minutes it had convulsive twitches & breathed as if affected with a disease to which chickens are subject called the pip. The twitches continued to increase, till there was scarcely a moments interval. In 70 minutes it became so bad that I thought it impossible for it to survive. In order to shorten its sufferings I poured some of the aqueous infusion of the root down its throat; this did not kill it immediately, & I determined to wait its effects. In nearly 6 hours after the exhibition of the first dose it expired.

Expt 5th – Ten drops of the tincture of the seed were poured down the throat of a mouse. At first its respiration was very rapid; afterwards its inspirations became very deep, & continued so till its death which took place in 5 minutes, without convulsions.

Expt. 6

infusion
pupils of
considerab
quently
into a very
stud nod
a pain. -
of the inj
-ting; th
tied accor
& he stare
-tored hi
with a
tied, &
the nigh
him a
Seven
results
conceiva

Expt. 6th To a small dog, ℥j of an aqueous infusion of the root was given. In 5 minutes the pupils of his eyes became dilated, & he appeared to have considerable difficulty in keeping them open, frequently nodding. 8th minute he laid down & fell into a very disturbed sleep. I then drove him up, he stood nodding for a few minutes & ~~then~~ laid down again. - I now gave him an injection p.r.a.n. of ℥j of the infusion. It induced a retching but no vomiting; he made a whining noise, & in 5 minutes laid down, & appeared to sleep soundly. I shook him, & he started from sleep much frightened, but soon closed his eyes again. - I gave him several stripes with a switch, by which he was aroused. - I then tied, & left him; but as he became very noisy in the night, some person cut him loose & I never saw him afterwards.

Several other experiments were made, but as the results differed but little from those stated, I deemed unnecessary to detail them. - These I hope are

sufficie-
hout. - T
ciple fo
stance, t
effects o

Eff

In the
the Effec
have repe
-eration
pulse we
-cy & ap
without p
stomach,
after la
-pernicio
the heart
of sight,
taking
-fects we

sufficient to establish the general properties of the plant. - From these it appears that the active principle pervades every part of it; & that in substance, tincture & infusion it exerts powerful effects on animal life.

Effects produced on the Human System.

In the experiments which I have made on the pulse the effects produced by this plant were not uniform. I have repeatedly taken of the spirituous & watery preparations of each part of it; in some instances the pulse was at first increased both in force & frequency & afterwards diminished; in others it was diminished without previous elevation. - But its effects on the stomach, head &c are less equivocal. In most instances after taking from 20 to 40 gts of the tincture I experienced pain at the stomach, a sensation of fullness of the head, pain in my eyes, attended with some dimness of sight, & thirst. Twice vomiting was excited by taking nearly ℥i of the tincture of the seed. - These effects were witnessed by my respectable friends & pel-

our Sta
so obliq
the Stre
of 10th
not much
stomach
raise the
great
stink wo
an hour
of the
of water
carrie
-quently
& arm
ul kind;
shad
that d
from

two students Messrs Stribling & Griggs, who were so obliging as to take portions of the tincture. — Mr Stribling took ℥j of the tincture of the root, made of 10^grs of the dried root in ℥iss of alcohol; his pulse was not much affected, but he had violent pains in his stomach & bowels. — Mr Griggs took XII^grs of the same tincture, he complained of pain in the head & great uneasiness at the stomach. — One effect which I think was produced by it, deserves to be mentioned here: Half an hour before bed time I took ℥ij of an infusion of XII^grs of the root in ℥iss of sp^ts of wine, & an equal quantity of water. After going to bed my respiration became hurried, I had unusual pain in my head, & frequently started from sleep. In the morning my side & arms were covered with an eruption which caused violent itching; it was examined by Mr Stribling who told me I had the itch. But it soon discovered that it was not that disease, by disappearing shortly after I arose from my bed, nor has it reappeared since

I have
consequence
for this
has come a
which I
He w
On the
when the
he, & a ne
he suspe
my brothe
fortune, m
very litt
this wa
home; bec
for my
think the
to proceed
the grap
in his co

I have heard of several cases, in which death was the consequence of eating the root of this plant, thro mistake for others which are escutent. The only case which has come under my notice is that of my brother, to which I alluded in the preceding part of this essay.

He was about 13 years of age, healthy & robust. On the 23rd of May 1810 he went into the meadow where the negroes were employed in ditching, & there he, & a negroe boy rather older, found this root which he supposed was sweet anise. The negroe boy says my brother ate a good deal of the root, but the former, not being pleased with the taste, swallowed very little.— After they had obtained as much as they wanted of the root, they were about to return home; but they advanced but a short distance, before my brother complained of great sickness & (I think the boy said) thirst. The boy encouraged him to proceed, but he was unable, & laid down on the grass. The boy, perceiving something unusual in his countenance, ran for assistance which was not

far distance
on seeing
=ed the ca
epheets) b
ais sent f
my Father
been expe
=ing voice
shrieks &
of his eyes
forcibly
with blood
quantity
fingers, c
he breathe
=sician g
was not we
=fect. The
which wa
few minu

far distant. – The young man who first got to him, on seeing some of the root by him, immediately suspected the cause of his malady (for he had heard of its effects) & sent for my Father. – A Physician was also sent for, who got to the place nearly as soon as my Father. – They arrived only in time to see him expire. – He no longer recognized the consoling voice of a fond Father, nor was sensible of the shrieks & caresses of a distressed mother. – The pupils of his eyes were dilated – his head & shoulders drawn forcibly backwards – & a viscid phlegm streaked with blood flowed out at his mouth. – A great quantity of the phlegm was drawn out by the fingers, which afforded no relief – On raising him up he breathed with the utmost difficulty. – The Physician gave him a large dose of Vitr. alb. (which was not weighed) to excite vomiting; but it had no effect. He then introduced a probang into the stomach which was equally ineffectual. – He expired in a few minutes after they arrived. – By computing

the time, it
there was h
boy was co
small qua
exercise w
have had
The other
=tended we
In some i
=ry of a
of large
been able
In the 3
Transac
of Virgin
piant w
I have s
Opinion
was to ob
contain

the time, it appears that his death took place in less than two hours after he ate of the root. — The negroe boy was not affected by what he ate, either from the small quantity; or probably the fright, & violent exercice which my brothers situation occasioned, may have had the effect of preventing its action.

The other cases which I have heard of, were attended with symptoms very analogous to the preceding. In some instances I have been informed, that the progress of death has been arrested, by the exhibition of large draughts of new milk. — But I have not been able to procure the history of those cases.

In the 3rd volume of the American Philosophical Transactions, a case is related by Dr. James Greenway of Virginia, proving the poisonous quality of a plant which I have little doubt is the same which I have spoken of. — In this I am confirmed by the opinion of the Professor of Materia Medica, who was so obliging as to furnish me with the book containing that case. — The only material dif=

= fence in
"while Lover
this in rice
= scribes h
fever ro
vomiting
the libe
"Sometim
was reac
in the co
= ly cal
the root,
received
for three
it up s
of it.
some tim
was mig
& found
= lys. They

ference is that he describes his plant as growing on "hilly barren lands," whereas I have only met with this in rich moist places. - The plant which he describes had the name of wild carrot, wild parsnip, fever root & mock eel root; he calls it Cicuta venenosa. - As his case is interesting I will take the liberty of quoting it:

"Sometime in the month of May last" (his paper was read in 1790) "three negroe boys were searching in the woods for wild angelica, or as they commonly call it eel root. They found a plant & dug up the root, but upon tasting it, the two elder of the boys perceived it was not the root they wanted. They therefore threw it down & left it. The youngest boy took it up said it was eel root & that he would eat some of it. They went on searching & digging for some time, at length their young companion was missing; they turned back the way they came & found him lying on the ground speechless & senseless. They took him up to carry him home.

A neighbour
related the
severity of
=tion of co
the greatest
days afte
boy to be
some me
who lives
=ed of a
spasm, a
limbs we
=e to be
except
gentleman
=ce of.
Immedi
see me
a day or
he has nev

A neighbour met them on the way to whom the boy related the story as above. The Gentleman upon whose veracity I relate this fact, being a man of reputation & character & in whose integrity I place the greatest confidence, told me the story a few days after it happened. He says he order'd the boy to be laid down under a tree, poured down some milk & oil & sent him home to his owner who lives within a mile. He was utterly deprived of sense, there was no convulsion or spasm, nor any degree of tension or stiffness. His limbs were perfectly limber & loose; he appeared to be in a deep sleep, deprived of all motion except that of respiration. The boys shewed this gentleman the plant that the deceased one had eaten of. Some of the leaves were shewn to me, which I immediately discover'd to be the species of hemlock here mentioned. The boy was carried home & after a day or two came to his senses again; but they think he has never perfectly recover'd; a small degree

of nullings
They eff
lated were
the possess
It is not a
agree & of
can be a
be the

neither
any thing
in any
student)
-ring ex
-tect of
its utiliz
-ane resm
-dent
properties
may be

of sullenness & stupidity still remains on his brain."

The effects in this case & that which I have related were not precisely similar, but they both prove the poisonous qualities of the roots which were eaten. It is not uncommon for the same cause, varied in degree & operating on different constitutions to produce dissimilar effects; this therefore can be no objection to my considering the plants to be the same.

As to the medicinal virtues of this article neither fact, nor experiment enables me to say any thing. I have not heard of its employment in any way as a medicine; & my situation as a student precluded me from opportunities, of making experiments with it in disease. The neglect of it as a medicine, is no argument against its utility; for many of our most important medicines have remained enveloped in obscurity, till accident has disclosed their virtues. Its poisonous properties certainly favor the conjecture that it may be found an useful medicine. For says

we learned
=no lessa
to look f
its una
presumed
some of
And as
very me
this he
=ved for
hereto fo
the discov
no prison
Prof poss
conclude
unauthor
to sma
=ting the
for me
serve.

an learned Professor of Mat. Med. speaking of Lau=
=ro Cerasus "Among these deleterious articles, we are
to look for the best preservatives of health". From
its analogy to some other active articles, we may
presume that it will be found beneficial in
some of the diseases to which they are adapted.
And as a small variation in properties may contribute
very much to the efficacy of a medicine, may not
this be one of the remedies which nature has reser=
=ved for the cure of some disease, which has hitherto
heretofore been the opprobrium of medicine? For
the discovery of the disease to which it is adapted,
no persons are so well calculated as the respectable
Professors of this university, to them I commit it &
confidently hope they will not find the subject
unworthy of their attention.

So much has been written on the means of preven=
=ting the effects of poisons, that it seems unnecessary
for me to dwell on that subject. I will only ob=
serve, that as cases are reported to have been relieved

by the use
attention.
used to the
emetic wo
to is not
=commend
after the
tobacco to
succeeded
medicines
in this
To th
tender my
=vantages
interesting
expressing
of Mateve
private
which

by the use of new milk & sweet oil, that they deserve attention. But I by no means think they should be used to the "exclusion of other remedies". Although an emetic was ineffectual in the case recited, I attribute it to its not being given sufficiently early & should recommend its administration if called in immediately after the poison was taken. — And as the application of tobacco to the epigastric region, as advised by Dr. Barton, has succeeded in causing opium to be ejected when internal medicines have failed, I think it should not be neglected in this case.

To the illustrious Professors of this University, I now tender my most sincere thanks, for the permanent advantages which I hope I have derived from attending their interesting Lectures. — I can not conclude without expressing my gratitude particularly to the Professors of Materia Medica & Anatomy, whose publick & private favors have made impressions on my mind which shall never be obliterated.